REMARKS/ARGUMENTS

1. Claims 1, 2, 15, 16, 27, and 28 are Patentable Over the Cited Art

The Examiner rejected claims 1, 2, 15, 16, and 27-28 as anticipated (35 U.S.C. §102(e)) by Ogawa (U.S. Patent No. 6,754,736).

Amended claims 1, 15, and 27 concern communicating with a device, and require: executing a kernel module in a memory; executing at least one kernel thread in the memory to execute device driver functions for the kernel module, wherein the device driver functions are capable of being invoked by system calls from applications operating in a user context; and executing, with the at least one kernel thread, calls to device driver functions for the kernel module running in a kernel context.

Applicants amended the claims to clarify that the kernel thread is executed to execute device driver functions for the kernel module. This added requirement is disclosed on at least paras. [0009]-[0011], on pgs. 3-4 of the Specification. Applicants further amended the claims to recite that the device driver functions are capable of being invoked by system calls by applications operating in a user context. This added requirement is disclosed in para. [0009], pgs. 3-4 of the Specification.

The Examiner cited the kernel thread (T0) of Ogawa discussed at col. 9, lines 16 and 66 in FIG. 9. The cited Ogawa discusses processes performed in response to an I/O request from a user process. A user process P0, P1, and P2 operating in a user space accepts an I/O request. The kernel threads T0, T1, T2 and asynchronous threads A0, A1, A2 operate n the kernel space and process an I/O request. (Ogawa, col. 9, lines 15-27). When the user process thread P0 issues an I/O request, the kernel thread T0 is invoked, and calls a data I/O function to activate the asynchronous thread A0. The activated synchronous thread A0 writes a value to the state variable, and the kernel thread T0 monitors this variable to determine whether to resume the process. (Ogawa, col. 9, line 63 to col. 10, line 30).

The cited cols. 9-10 of Ogawa discuss how kernel threads are executed to process an I/O request from a user process. Nowhere do the cited cols. 9-10 disclose the requirement that a kernel module execute a kernel thread to call device driver function in a kernel context, where the device driver functions are those device driver functions capable of being called by system calls in the user context. Instead, the cited cols. 9-10 discuss kernel threads that may be invoked to process an I/O request from a user process.

There is no disclosure of the claim requirement that the kernel threads of Ogawa may invoke the same device driver functions that system calls from the user mode or user processes may invoke. Instead, in the cited Ogawa, the kernel threads are invoked when the user process issues an I/O request.

Accordingly, Applicants submit that the amended claims are patentable over the cited art because the cited Ogawa does not disclose all the requirements.

Claims 2, 16, and 28 are patentable over the cited art because they depend from one of claims 1, 15, and 27, which are patentable over the cited art for the reasons discussed above.

2. Claims 3-10, 13, 17-23, 25, 29-35, and 38 are Patentable Over the Cited Art

The Examiner rejected claims 3-10, 13, 17-23, 25, 29-35, and 38 as obvious (35 U.S.C. §103) over Ogawa in view of Corbet ("Linux Device Drivers, 2nd Ed., by J. Corbet and A. Rubini).

First off, these claims are patentable over the cited art because they depend from one of claims 1, 15, and 27, which are patentable over the cited art for the reasons discussed above. Moreover, the following dependent claims provide additional grounds of patentability over the cited art.

Claims 3, 17, and 29 depend from claims 1, 15, and 27, respectively, and further require accessing, with one kernel thread, device information from the device and buffering the accessed device information.

The Examiner cited sec. 11.1.2, line 4 and sec. 14.3.2.2, line 1 of Corbet as teaching the requirements of the kernel thread accessing device information from the device. (Office Action, pg. 5) Applicants traverse.

The cited section 11.1.2 mentions that the kernel mode may run a help program in the user context and the cited sec. 14.3.2.2 mentions that with the char and block drivers, each network device declares the functions that act on it. Nowhere do the cited sections of Corbet teach or suggest that the kernel thread access device information from the device.

Accordingly, claims 3, 17, and 29 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not taught or suggested in the cited combination o references.

Claims 5, 19, and 31 depend from claims 1, 15, and 27, respectively, and further require that the kernel thread accesses buffered device information periodically and independently of kernel module requests for the device information.

The Examiner cited the hard_start_xmit method and net_device_structure in sections 14.3.2.2 of Corbet as teaching these claim requirements. (Office Action, pg. 6) Applicants traverse

The cited hard_start_xmit is a method that initiates the transmission of a packet where the full packet is contained in a socket buffer. The cited section 14.3.2.2 further mentions device methods for a network interface. The net_device method stops the interface. Although the cited Corbet discusses methods for transmitting packets, nowhere is there any teaching or suggestion that a kernel thread access buffered device information periodically and independently of kernel module requests for the device information.

Accordingly, claims 5, 19, and 31 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not taught or suggested in the cited combination o references.

3. Claims 11, 12, 14, 24, 26, 36, 37, and 39 are Patentable Over the Cited Art

The Examiner rejected claims 11, 12, 14, 24, 26, 36, 37, and 39 as obvious (35 U.S.C. §103) over Ogawa in view of Corbet and further in view of Ryan ("Synchronization in Portable Device Drivers", by Stein J. Ryan).

These claims are patentable over the cited art because they depend from one of claims 1, 15, and 27, which are patentable over the cited art for the reasons discussed above. Moreover, the following dependent claims provide additional grounds of patentability over the cited art.

Claims 14, 26, and 39 depend from claims 1, 15, and 27 and further require: initiating, with the kernel module, an access request with respect to device information; disabling any higher priority contexts capable of accessing the device information; obtaining a lock for the device information subject to the access request; providing the kernel module access to the device information; releasing the lock; and enabling all higher priority contexts that were disabled.

The Examiner cited pg. 21, right col., lines 10-11 of Ryan as teaching the claim requirement of disabling any higher priority contexts capable of accessing the device information. (Office Action, pg. 11) Applicants traverse.

Then cited pg. 21 of Ryan mentions disabling interrupts in the software masks that disables second stage interrupt processing, but not disable the first stage interrupt processing. This cited pg. 21 does not teach the claim requirement of disabling any higher priority contexts capable of accessing the device information. In fact, the cited pg. 21 teaches away from this claim requirement because the cited pg. 21 mentions that first stage interrupt processing is not disabled. Further, the cited pg. 21 does not teach disabling any higher priority contexts capable of accessing device information. The cited pg. 21 does not teach that the disabled second stage interrupt processing accesses device information as claimed.

Accordingly, claims 14, 26, and 39 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not taught or suggested in the cited combination o references.

Conclusion

For all the above reasons, Applicant submits that the pending claims 1-39 are patentable. Should any additional fees be required beyond those paid, please charge Deposit Account No. 50-0585.

The attorney of record invites the Examiner to contact him at (310) 553-7977 if the Examiner believes such contact would advance the prosecution of the case.

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By: /David Victor/

David W. Victor
Registration No. 39,867

Please direct all correspondences to:

David W. Victor
Konrad Raynes & Victor, LLP
315 South Beverly Drive, Ste. 210
Beverly Hills, CA 90212
Tel: (310) 553-7977
Fax: 310-556-7984